

Riding the COVID-19 Tsunami in India: A nephrologist's perspective



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The COVID-19 pandemic has brought about the realization that the true progress of a nation can be determined from the strength of its health care system. The country of India, and the battle it is waging with SARS CoV-2, has become a striking example of how the lack of pandemic preparedness can bring a nation to dire circumstances. The first COVID-19 case in India was officially reported on January 30, 2020. Since then, the epidemic spread so rapidly that by the end of March 2020, a nationwide lockdown was imposed in a bid to control the rising swell of COVID-19 cases. Even with the tireless efforts of law enforcement agencies and increasing awareness among the general population, health care workers around the country worked around the clock to bring about some measure of control. Nevertheless, the infection rate came down and by January 2021 (roughly 1 year since the first reported case) India began reporting a significant reduction in the number of newly

infected cases with the rate of those recovering from COVID-19 exceeding the rate of new infections. It was believed that the worst of the pandemic had passed, and life could gradually return to normal. Lockdown measures were relaxed, and the health care agencies began to relax. In retrospect, it was perhaps a false sense of security that brought back the pandemic with a vengeance.

In early March 2021, case numbers started to climb again—so rapidly that India became the country with the highest number of infected patients. On April 30, 2021, India became the first country to report >400,000 new cases in a single day.¹ It should be emphasized that the reported cases of COVID-19 in India dramatically underrepresents the true number of COVID-19 cases and deaths. A significant portion of the population lives in remote areas, and it is presumed that a good percentage of that population were never tested or presented for medical care, possibly dying without receiving an official diagnosis of COVID-19 infection. For this reason, many believe that the true COVID-19 count in India is much larger than officially reported. Several factors are responsible for this deluge, including

overcrowding, poverty, limited resources, the lack of public cooperation, and most importantly, the lack of an effective disaster control plan.

CHRONIC KIDNEY DISEASE

While the pandemic took no prisoners, those with chronic kidney disease and end-stage kidney disease (ESKD) were significantly affected. Again, the lack of a registry and underreporting leads to inaccurate statistics; however, several kidney care practitioners in the country have published data that are illuminating. Patients with ESKD who are on maintenance hemodialysis were left with few options as dialysis units around the country implemented COVID-19-exclusive policies because of the lack of manpower and isolation facilities. Strict lockdown rules and related travel restrictions made it difficult for patients to travel to their dialysis centers, leading to missed dialysis sessions or complete dialysis discontinuation. In some cases, nephrologists were forced to request dialysis patients to reduce dialysis frequency as hemodialysis machines and nurses were diverted for the care of patients in critical intensive care units. In addition, resources became scarce because of the inflated cost of in-center dialysis in the name of protective equipment, infection control, and local isolation of the patient.² Many of these patients turned to peritoneal dialysis (PD) as an alternative. With the shortage of PD solutions, lack of patient/caregiver training and more importantly hesitancy to insert PD catheters by nephrologists and surgeons, PD did not stand the test of time.

In a multicenter study, including 19 centers, it was found that 28.2% of patients missed ≥ 1 dialysis session(s), while 4.13% stopped reporting for dialysis altogether.² Trivedi *et al.*³ studied 37 consecutive patients with ESKD from 2

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dialysis centers in Mumbai, India, and found that 27% of patients presented with severe symptoms of COVID-19—alarmingly, all of these patients died. In this study, 30% of patients presented with an extended dialysis break. Recently, Kakkanattu *et al.*⁴ analyzed the impact and outcomes of COVID-19 infection in patients who were part of a national dialysis network program in India. Of 14,573 patients 1279 tested positive, and 22.91% of patients died. Among the patients with ESKD who tested negative, 2560 patients died, bringing the mortality rate to 19.25% in the pandemic period. It should be pointed out here that most of these data predate the second COVID-19 surge.

ACUTE KIDNEY INJURY

The causes of acute kidney injury (AKI) in patients with COVID is multifactorial. In their study to assess safety of remdesivir in patients with deranged kidney function, Thakare *et al.*⁵ found that AKI was present in 30 (65.3%) of 46 patients. The mortality rate of patients with AKI is higher than those with no kidney involvement. Adding insult to injury is the high rate of mucormycosis in patients with COVID-19 and those who have recently recovered. Mucormycosis (“black fungus”) is a rare fungal infection caused by molds called Mucormycetes. These are present in the environment and mainly infect immunocompromised individuals. This was not seen in the first wave. Direct mucor infection of the kidney and AKI caused by amphotericin B is on the rise, but the exact number is yet to be estimated.

KIDNEY TRANSPLANTATION

The number of kidney transplantations (KTs) declined significantly with the deceased donor program. A survey of 19 hospitals revealed that while 132 KT were performed in the month before the

pandemic declaration, only 33 were performed in the following month.² Indeed, KT became a risky gamble as both prospective donors and kidney transplant recipients (KTRs) started testing positive for COVID-19. To determine the effects of COVID-19 infection among prospective kidney donors, Kute *et al.*⁶ followed 31 KTRs who received a kidney from a living donor who had previously tested positive for COVID-19. The donors had to be completely symptom free for 28 days and test negative for SARS CoV-2 infection by a molecular test, only after which KT was undertaken. It is noteworthy that both patient and graft survival was 100% at median follow-up of 44 days. Both donors and recipients remained asymptomatic in the posttransplantation period. In a separate study, Kute *et al.*⁷ presented the data of 75 KTRs who themselves underwent KT after recovering from COVID-19. Results were again encouraging with all recipients and donors being asymptomatic with normal creatinine at a median follow up of 81 days after surgery. In this study too, patient and graft survival were reported as 100%.

AKI IN KTR

In a multicenter study, Bajpai *et al.*⁸ studied 452 KTRs, of whom 50 had COVID-19—

associated AKI. Complete recovery of kidney function was noted in 40.5% at a median follow-up of 3 months. At 3 months, a kidney biopsy specimen was obtained from patients with new onset/worsening proteinuria and persistent graft dysfunction. Among the varied findings were acute tubular injury, thrombotic microangiopathy, acute cellular rejection, and chronic antibody-mediated rejection. It was concluded that graft recovery may remain incomplete in AKI secondary

to COVID-19. These findings suggest that close follow-up of kidney function in KTRs bears merit. In another study, Bajpai *et al.*⁵¹ followed 47 KTRs with symptomatic COVID-19 for development of anti-SARS COV-2 IgG antibodies. Of these, 67.2% patients achieved seroconversion, with 63.4% doing so within 2 weeks. These findings suggest that even in this immunocompromised group of patients, seroconversion could be achieved, and vaccination could be efficacious in protecting this vulnerable population. Similar data on development of lasting immunity after vaccination against COVID-19 is yet to be published. As India has now started vaccinating individuals in the 18- to 45-year-old age group, it is hoped that more information on immunity postvaccination in KTRs will soon be forthcoming.

TELENEPHROLOGY

The pandemic has led to the emergence of a new frontier in the field of nephrology—that of telemedicine or telenephrology. This has become an attractive alternative for nephrologists to follow-up with patients during COVID-19-related lockdowns. Chandra *et al.*⁵² reported their experience and suggested that telenephrology might be a good alternative for patients who have already been locally evaluated or who were on a regular follow-up schedule.

In conclusion, 2 months into this explosive COVID-19 surge, the second tide of COVID seems to be receding with a drop in the daily count of cases. The number of patients infected with fatal fungal infections, such as mucormycosis and aspergillosis, is on the rise—and reasons for this are unclear. Today, approximately 3.2% of India's population is fully vaccinated.⁵³ An effective vaccination strategy at this point in time may be the only way out of this crisis.

Where we're headed—only time will tell!

DISCLOSURE

All the authors declared no competing interests.

SUPPLEMENTARY MATERIAL

Supplementary File (PDF)

Supplementary References.

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